REMARKS

Claims 1 to 4, 6, 7, 12 and 14 are pending in the application, with 1, 7, 12 and 14 being the independent claims. Reconsideration and further examination are respectfully requested.

Claims 1 to 4, 6 and 7 were rejected under 35 U.S.C. § 103(a) over U.S. Patent No. 6,108,008 (Ohta), U.S. Patent No. 6,151,025 (Yen) and U.S. Patent No. 6,204,933 (Yoshino); and Claims 12 and 14 were rejected under § 103(a) over Yoshino and U.S. Patent No. 5,317,426 (Hoshino). Reconsideration and withdrawal of these rejections are respectfully requested.

Turning to specific claim language, independent Claim 1 is directed to an image processing apparatus for converting input color data to color component data, having a plurality of color component units, to be outputted by using a color conversion table, the apparatus including a first storage, arranged to store at least one compressed color conversion table, wherein data of the compressed color conversion table are arranged in order according to a set of grid point numbers in each color component unit, an expander, arranged to expand the compressed color conversion table, a sorter, arranged to sort data included in the expanded color conversion table while a combination of output color components of a grid point is kept, and a converter, arranged to convert the input color data to the color component data using the expanded color conversion table.

In this manner, the invention of independent Claim 1 utilizes an efficiently compressed color conversion table which can be expanded and used for converting color image data, thereby reducing the necessary storage capacity required for the conversion process. (Specification, page 2, line 14, to page3, line 9). In the present invention, combinations of plural color component data included in the color conversion table are

arranged by grid points as shown in Figure 2C. On the other hand, a compression processing of the color conversion table is efficiently performed when the data of the color conversion table has been sorted to be arranged in order according to a set of grid point numbers in each color component, as shown in Figure 3. According to the present invention of independent Claim 1, the data of a compressed LUT stored in a first storage are arranged in order according to the set of the grid point numbers in each color component unit, and a sorter sorts the data of a LUT expanded from the compressed LUT while maintaining a combination of output color components of the grid point.

The applied art, namely Ohta, Yen, Yoshino and Hoshino, is not seen to disclose or suggest the foregoing features of independent Claim 1. In particular, the applied art is not seen to disclose or suggest at least the features of storing at least one compressed color conversion table, *wherein data of the compressed color conversion table are arranged in order according to a set of grid point numbers in each color component unit*, and then expanding the compressed color conversion table, sorting data included in the expanded color conversion table *while keeping a combination of output color components of a grid point.*

As discussed in Applicant's previous Amendment, Ohta is seen to be concerned with rendering a preview image as it would appear if it were formed by a predetermined image device, wherein the rendered preview image is created using a stored profile which corresponds to the predetermined image forming device. (Ohta, abstract; Figure 2; and column 1, lines 60 to 67). Although Ohta is seen to disclose the use of three-dimensional look-up tables (LUT) for converting Lab color space to CMYK color space, the three-dimensional look-up tables in Ohta are not seen to be compressed and are not seen to arrange the data contained therein in order according to a set of grid point numbers

in each color component unit. (Ohta, column 13, lines 20 to 48; and column 14, lines 35 to 39). Finally, nowhere is Ohta seen to teach to sort data included in an expanded color conversion table, from the compressed color conversion table, while a combination of output color components of a grid point is kept.

Also as previously discussed by Applicant, Yen is not seen to remedy the foregoing deficiencies of Ohta. Specifically, Yen is seen to utilize a compressed look-up table for use in two-dimensional linear convolutions for image processing. (Yen, abstract; column 4, lines 51 to 67; and column 8, lines 49 to 54). The look-up table of Yen is merely seen to contain partial results which are obtained by determining possible patterns for a row of an input pixel window and multiplying the possible patterns by a corresponding row of a convolution kernel matrix. (Yen; column 5, lines 17 to 25). In this manner, the calculation results are pre-stored in the look-up table for application to an actual row of an input pixel window, thereby saving calculation processing time during convolutions for image processing, such as for a smoothing operation.

However, the lookup table of Yen is not seen to be a compressed color conversion table wherein data of the compressed color conversion table are arranged in order according to a set of grid point numbers in each of a plurality of color component units. The lookup table in Yen is merely seen to be a compressed table for use in performing a smoothing operation. The lookup table in Yen is not seen to be concerned with plural color components, much less wherein the data is arranged in order according to a set of grid point numbers in each color component unit. Also, nowhere is Yen seen to teach sorting the data included in the expanded color conversion table, expanded from the compressed color conversion table, while a combination of output color components of a grid point is kept.

Neither Hoshino nor Yoshino are seen to remedy the foregoing deficiencies of Ohta and Yen. In particular, Hoshino is seen to be directed to transforming a color image from a first color gamut to a second color gamut. (Hoshino, abstract; and column 3, lines 1 to 45). Hoshino is seen to use look-up tables 211 to 213 in order to convert CMYK image data to compressed CMYK image data. (Hoshino, column 6, lines 40 to 45). The compressed CMYK image data is then converted to RGB image data for display on a color CRT. (Hoshino, column 6, lines 46 to 49). Look-up tables 211 to 213 of Hoshino are seen to constitute a first color conversion means, but are not seen to themselves be compressed. Instead, they are simply seen to be used to output compressed image data. (Hoshino, column 6, lines 40 to 56). In particular, the term "compressed" as used in Hoshino is seen to be directed to converting CMYK print data to CMYK print data as it would be rendered by a printing device having a compressed color gamut. (Hoshino, column 7, lines 55 to 58). The color image data as it would be rendered by the compressed color gamut of the output device is then converted to RGB for display on the CRT so as to provide a preview of the color image data as it would appear in the compressed color gamut of the output printing device. (Hoshino, column 6, lines 30 to 54). However, nowhere is Hoshino seen to disclose or suggest that the look-up tables 211 to 213 themselves are compressed in size so as to reduce the required storage capacity as in independent Claim 1. In addition, Hoshino is not seen to disclose or suggest arranging color data in order according to a set of grid point numbers in each of a plurality of color component units, much less to sort data included in the expanded color conversion table while a combination of output color components of a grid point is kept.

The Office Action cites Yoshino for allegedly teaching the sorting feature of independent Claim 1. However, Yoshino is seen to be directed to the use of compressed

image data to pass to a printer which expands the compressed image data for printing, for efficient print data transmission and memory use. (Yoshino, abstract; and column 2, lines 1 to 15). Yoshino is merely seen to "set" a particular type of color processing table to carry out color processing for a color printer. (Yoshino, Fig. 16; and column 9, lines 45 to 51). However, Yoshino is not seen to disclose or suggest a color conversion table in which color data are arranged in order according to a set of grid point numbers in each of a plurality of color component units. Neither is Yoshino seen to sort data included in the expanded color conversion table while a combination of output color components of a grid point is kept.

In this regard, it is alleged in the Office Action that Yoshino teaches the "sorting" feature of the claimed invention. Applicant again strongly disagrees with this assertion, and submits that the assertion is a misreading of the text in Yoshino which is taken out of context from the teachings of Yoshino. In particular, the portion of Yoshino cited in the Office Action states that "[i]n a case of the color print, *a sort of a table* for necessary to carry out the color processing *is set*, in this time in a case where the color laser printer 21A has a resource therein, *a table* which is provided an interior portion therein *is set*, on the other hand in a case where a data of the table is transmitted from the personal computer 20A, such an above stated *table is set.*" (Yoshino, column 9, lines 45 to 51). Clearly, the foregoing language of Yoshino has to do with *setting the proper sort (type or kind) of table,* and has nothing to do with actually performing a sorting operation on the data within the table. Rather, the foregoing language is merely seen to teach the selection (*setting)* of an appropriate type (*sort*) of table. Nowhere is Yoshino seen to mention that a sorting operation is performed on a table, much less where the data included in the expanded color conversion table is sorted while a combination of output color components

of a grid point is kept. In this regard, the Office Action has again failed to cite a specific portion of Yoshino which discloses the sorting of data within a conversion table according to the features of independent Claim 1.

Based on the foregoing, Applicant respectfully submits that the applied art, either alone or in combination, is not seen to disclose or suggest the foregoing combination of independent Claim 1. (M.P.E.P. § 2143).

Accordingly, Applicant submits that independent Claim 1 is believed to be in condition for allowance, and such action is respectfully requested. In addition, independent Claim 7 is directed to an image processing method which includes substantially similar features as those of independent Claim 1. Independent Claim 7 is therefore also believed to be in condition for allowance for the same reasons discussed above with respect to independent Claim 1.

Independent Claim 12 is directed to a data processing method of compressing a color conversion table for converting input color data to color component data, having a plurality of color component units. The method includes inputting data of the color conversion table where combinations of plural color component data are arranged by grid points, sorting the data of the color conversion table so that the data are arranged in order according to a set of grid point numbers in each color component unit, and compressing the sorted color conversion table.

As mentioned above with respect to independent Claim 1, none of the applied references are seen to disclose or suggest inputting data of the color conversion table where combinations of plural color component data are arranged by grid points, sorting the data of the color conversion table so that the data are arranged in order

according to a set of grid point numbers in each color component unit, and compressing the sorted color conversion table.

As stated above, Hoshino is not seen anywhere to disclose or suggest that look-up tables 211 to 213 of Hoshino are compressed. Instead look-up tables 211 to 213 of Hoshino are seen to merely be used to convert CMYK image data to CMYK image data in a compressed color space. (Hoshino, column 6, lines 40 to 54). In this regard, the term "compressed printing data" used in Hoshino is directed to mapped data stored in a LUT, where the mapped data is mapping the input color data to the gamut of the printer. Accordingly, as clearly seen by a reading of Hoshino, the term "compressed" as used in Hoshino merely means to compress the color gamut of the input data into the gamut of the printer, and is not seen in any way to refer to the compression of data in a color conversion table according to the present invention. In addition, as admitted in the Office Action, Hoshino is not seen to disclose or suggest sorting the conversion table data in a color component unit.

Also, as stated above, Yoshino is merely seen to teach that the setting of an appropriate type of table, but nowhere is Yoshino seen to mention that a sorting operation is performed on a table, much less where the data included in the expanded color conversion table is sorted while a combination of output color components of a grid point is kept.

Accordingly, the applied art, either alone or in combination, is not seen to disclose or suggest the combination of features of independent Claim 12. Accordingly, independent Claim 12 is believed to be in condition for allowance, and such action is respectfully requested. In addition, independent Claim 14 is directed to a computer program product which includes substantially similar features as those of independent

Claim 12. Independent Claim 14 is therefore also believed to be in condition for allowance for the same reasons discussed above with respect to independent Claim 12.

The other pending claims are each dependent from the independent claims discussed above and are therefore believed patentable for the same reasons. Because each dependent claim is also deemed to define an additional aspect of the invention, however, the individual consideration of each on its own merits is respectfully requested.

In view of the foregoing remarks, the entire application is believed to be in condition for allowance, and such action is respectfully requested at the Examiner's earliest convenience.

Applicant's undersigned attorney may be reached in our Costa Mesa, CA office at (714) 540-8700. All correspondence should continue to be directed to our below-listed address.

Respectfully submitted,

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